

What is Claimed is:

1. A method for quantifying an analyte in a sample, said method comprising:
 - a) administering a fusion protein to said sample, said fusion protein comprising a functional periplasmic binding protein (PBP), at least one labeling moiety and at least one fluorescent protein; and
 - b) measuring the luminescence of said fluorescent fusion protein, wherein said luminescence is indicative of the amount of analyte in said sample.
2. The method of claim 1, wherein said measuring is performed at more than one time point in the same sample.
3. The method of claim 1, wherein said measurement can be made continuously.
4. The method of claim 1, wherein said fusion protein binds reversibly to said analyte.
5. The method of claim 1, wherein said sample is a biological fluid.
6. The method of claim 1, wherein said quantifying comprises calculating a ratio of the fluorescence of said at least one fluorescent protein to the fluorescence of said at least one labeling moiety.
7. The method of claim 1, wherein said fusion protein comprises at least two fluorescent proteins.
8. The method of claim 7, wherein said quantifying comprises calculating a ratio of the fluorescence of said at least two fluorescent proteins.
9. The method of claim of claim 8, wherein said at least two fluorescent proteins are not identical.

10. The method of claim 1, wherein said functional PBP is selected from the group consisting of glucose-galactose binding protein (GGBP), maltose binding protein (MBP), ribose binding protein (RBP), arabinose binding protein (ABP), dipeptide binding protein (DPBP), glutamate binding protein (GluBP), iron binding protein (FeBP), histidine binding protein (HBP), phosphate binding protein (PhosBP), glutamine binding protein (GBP), oligopeptide binding protein (OppA) and derivatives thereof.
11. The method of claim 10, wherein said functional PBP is GGBP or a derivative thereof.
12. The method of claim 10, wherein said analyte is glucose.
13. The method of claim 1, wherein said at least one fluorescent protein is selected from the group consisting of a green fluorescent protein (GFP), red-shifted GFP (rs-GFP), a red fluorescent protein (RFP), a yellow fluorescent protein (YFP), a cyan fluorescent protein (CFP), a blue fluorescent protein (BFP), enhanced versions thereof and mutations thereof.
14. The method of claim 13, wherein said at least one fluorescent protein is RFP.
15. The method of claim 14, wherein said RFP is selected from the group consisting of DsRed2, HcRed1, DsRed-Express and mutations thereof.
16. The method of claim 15, wherein said RFP is the DsRed2 mutant DsRed2(C119A).
17. The method of claim 1, wherein said labeling moiety is a fluorophore.
18. The method of claim 17, wherein said fluorophore is selected from the group consisting of fluorescein, acryoldan, rhodamine, BODIPY, eosin, pyrene, acridine orange, PyMPO, alexa fluor 488, alexa fluor 532, alexa fluor 546, alexa fluor 568, alexa fluor 594, alexa fluor 555, alexa fluor 633, alexa fluor 647, alexa fluor 660 and alexa fluor 680.

19. A composition comprising a fusion protein portion and at least one labeling moiety, said fusion protein portion comprising a functional periplasmic binding protein and at least one fluorescent protein.
20. The composition of claim 19, wherein said functional periplasmic binding protein is selected from the group consisting of glucose-galactose binding protein (GGBP), maltose binding protein (MBP), ribose binding protein (RBP), arabinose binding protein (ABP), dipeptide binding protein (DPBP), glutamate binding protein (GluBP), iron binding protein (FeBP), histidine binding protein (HBP), phosphate binding protein (PhosBP), glutamine binding protein, oligopeptide binding protein (OppA) and derivatives thereof.
21. The composition of claim 20, wherein said functional PBP is GGBP or a derivative thereof.
22. The composition of claim 21, further comprising at least one additional fluorescent protein.
23. The composition of claim 22, wherein said at least two fluorescent proteins are not identical.
24. The composition of claim 19, wherein said at least one fluorescent protein is selected from the group consisting of a green fluorescent protein (GFP), a red-shifted GFP (rs-GFP), a red fluorescent protein (RFP), a yellow fluorescent protein (YFP), a cyan fluorescent protein (CFP), a blue fluorescent protein (BFP), enhanced versions thereof, and mutations thereof.
25. The composition of claim 24, wherein said at least one fluorescent protein is RFP.

26. The composition of claim 25, wherein said RFP is selected from the group consisting of DsRed2, HcRed1, dsRed-Express and mutations thereof.
27. The composition of claim 26, wherein said RFP is the DsRed2 mutant DsRed2(C119A).
28. The composition of claim 27, wherein said labeling moiety is a fluorophore.
29. The composition of claim 28, wherein said fluorophore is selected from the group consisting of fluorescein, acryoldan, rhodamine, BODIPY, acridine orange, eosin, pyrene, acridine orange, PyMPO, alexa fluor 488, alexa fluor 532, alexa fluor 546, alexa fluor 568, alexa fluor 594, alexa fluor 555, alexa fluor 633, alexa fluor 647, alexa fluor 660 and alexa fluor 680.
30. A vector comprising a nucleic acid sequence coding for the fusion protein portion of the composition of claim 19.
31. A host cell comprising the vector of claim 30.
32. A method of producing a protein, comprising culturing the host cell of claim 31 under conditions such that said protein is expressed, and recovering said protein.
33. A kit for detecting the concentration of an analyte in a sample, said kit comprising the composition of claim 19.
34. The kit of claim 33, wherein said functional periplasmic binding protein is selected from the group consisting of glucose-galactose binding protein (GGBP), maltose binding protein (MBP), ribose binding protein (RBP), arabinose binding protein (ABP), dipeptide binding protein (DPBP), glutamate binding protein (GluBP), iron binding protein (FeBP), histidine binding protein (HBP), phosphate binding protein (PhosBP), glutamine binding protein, oligopeptide binding protein (OppA) and derivatives thereof.

35. The kit of claim 34, wherein said functional periplasmic binding protein is glucose-galactose binding protein (GGBP) or a derivative thereof.
36. The kit of claim 35, wherein said analyte is glucose.
37. The kit of claim 36, wherein said at least one fluorescent protein is selected from the group consisting of a green fluorescent protein (GFP), a red-shifted GFP (rs-GFP), a red fluorescent protein (RFP), a yellow fluorescent protein (YFP), a cyan fluorescent protein (CFP), a blue fluorescent protein (BFP) and enhanced versions thereof.
38. The kit of claim 37, wherein said at least one fluorescent protein is RFP.
39. The kit of claim 38, wherein said RFP is discosoma red fluorescent protein (DsRed2).